

Docket No.: 84936
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Shyam S Bayya et al.

Application No.: 10/758750

Confirmation No.: 6396

Filed: January 15, 2004

Art Unit: 1755

For: OPTICAL TRANSMISSION OF BGG GLASS MATERIAL
Examiner: D. R. Sample

DECLARATION UNDER 37 CFR 1.132

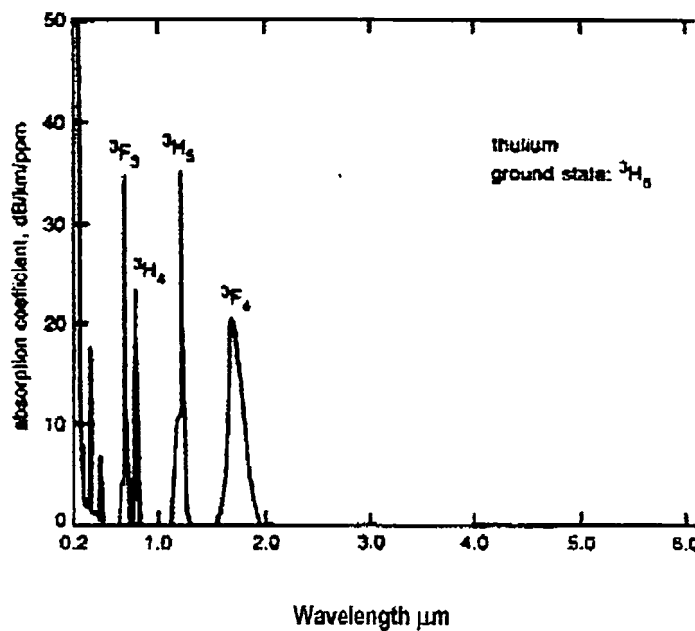
I, Shyam S. Bayya, having been advised of the penalties for perjury, declare as follows:

1. I am a citizen and resident of the United States of America.
2. I was working in the capacity of Research Scientist for the Naval Research Laboratory, (NRL) Washington, DC, the assignee of the above-identified application, at the time of the invention.
3. I am a co-inventor of the above-identified application, U.S. Application Serial No. 10/758750 for OPTICAL TRANSMISSION OF BGG GLASS MATERIAL, which names Jasbinder S. Sanghera and Ishwar D. Aggarwal as the co-inventors.

Docket No.: 84936
(PATENT)

4. I have read the Dejneka Patent No. 6589895, and present the following discussion of the reference in order to provide understanding of the present invention and the differences between Hossain and U.S. Patent Application No. 10/758750.
5. The composition disclosed in the present patent application is different from the one disclosed by Dejneka. All the glasses disclosed by Dejneka contain Thulium compound (Tm_2O_3). The glass compositions disclosed in U.S. Patent Application No. 10/758750 are free from Tm_2O_3 . This provides an important difference in the properties of the BGG glass. Even small quantities, such as the 0.001 mole% of Tm_2O_3 as disclosed by Dejneka, will have a strong absorption in the 0.3-2.0 μm wavelength range as shown in Figure 1 below. Thus, the glass of Dejneka cannot be used for the vis-IR windows and dome applications discussed in the present application. Fig. 1 shows the absorption spectra of Thulium showing a strong absorption up to 2 μm .

Docket No.: 84936
(PATENT)

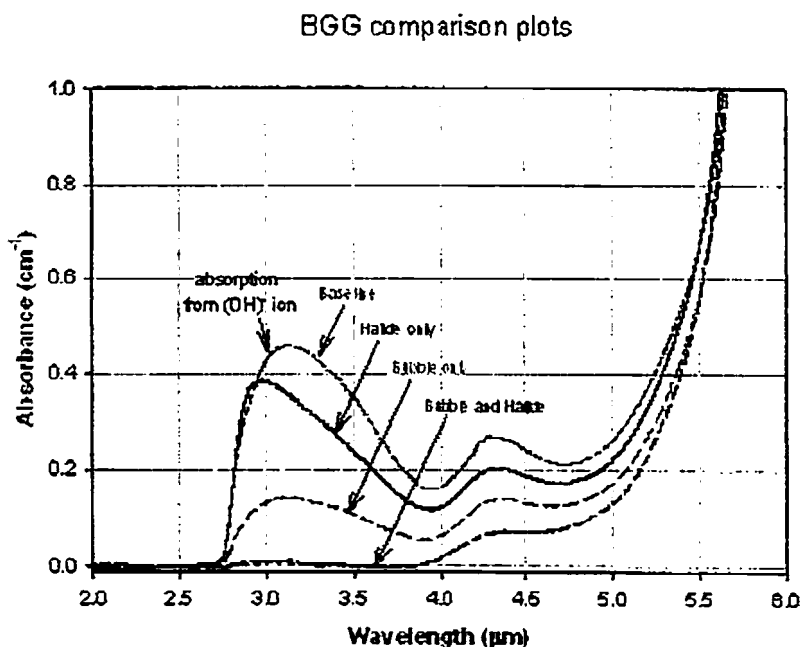


6. In most of the compositions disclosed by Dejneka in various tables of his patent, there are other components such as K_2O , Al_2O_3 , CaO , and CeO_2 which are not part of the BGG glass composition of the present invention. Lighter components such as CaO and Al_2O_3 shift the infrared cutoff wavelength to shorter wavelength reducing the IR transmission near 5 μm wavelength.

7. The present application provides for bubbling the glass melt, as discussed in the specification on page 17, line 10 in Example 1. This step helps to lower the OH^- ion concentration in the glass. Figure 2 below shows an absorption plot as a function of wavelength for the BGG glass. When no bubbling or halide addition is done, the glass has a large absorption peak at about 3 μm. When halides are added to the glass melt, as taught by Dejneka, the absorption peak is lowered but still present in significant quantity. Better results are obtained with simply bubbling the glass melt with dry gasses without addition of any halides. However,

Docket No.: 84936
(PATENT)

the best results are obtained, as disclosed in the present application, when halides are added and also the glass is bubbled to remove the hydroxyl ions out of the glass melt. Figure 2 shows the effect of halide addition and bubbling on BGG glass purification. The absorption loss in the 2.75 – 3.75 μm wavelength range is due to the presence of $(\text{OH})^-$ ions in the glass. Bubbling the melt is additionally reduces the absorption loss in the glass.



8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States

Docket No.: 84936
(PATENT)

Code, and that such willful false statements may jeopardize the validity of the patent application
or any patent issuing thereon.

Date: 6/15/2006

Signature: Shyam S. Bayya

Shyam S. Bayya